

AMENDMENTS TO THE CLAIMS

1. (AMENDED) ~~Optical~~ An optical switch comprising:

~~at least one~~ a first input optical path; ~~(31) and at least~~

a first and a second output optical paths; ~~(35,37)~~

a control device; and

a micromirror ~~(41) able to move~~ movable between an output of the first input optical path and inputs of the first and second output optical paths, the first input optical path and the first output optical path having an identical first optical axis, ~~called first optical axis~~, and the second output optical path having ~~an~~ a second optical axis, the first and second optical axes respectively forming an angle relative to an axis of symmetry called second optical axis,

wherein the micromirror ~~comprising~~ comprises:

a reflector part ~~(13)~~ and an actuating part, ~~(15)~~

the actuating part having an axis of rotation, ~~(17) and able~~ the actuating part being configured to drive the reflector part in rotation about a ~~plane called a tilt plane (B)~~, the tilt plane being substantially perpendicular to a plane containing the axis of rotation, and

the said reflector part including ~~at least one~~ a reflective face ~~(R)~~ in a plane substantially parallel to the tilt plane, the reflective face being configured ~~plane able~~ to reflect a light wave coming ~~derived~~ from the first input path towards the second output path,

wherein the control device is configured to tilt the reflector part, ~~the first and second optical axes respectively forming an angle α relative to an axis of symmetry (S), the optical switch further comprising a control device to tilt the reflector part, this~~ the control device comprising a first set of electrodes ~~(J1)~~ arranged on the actuating part, a second set of electrodes ~~(J2) arranged facing the first set~~ of electrodes, and means for applying a potential

~~difference between the two sets of electrodes~~ the first and second set of electrodes adapted to having a potential difference applied thereacross.

2. (AMENDED) ~~Optical~~ An optical switch as in claim 1, ~~characterized in that it comprises a first input optical path (31) associated with a first and a second output optical paths (35,37) and further comprising a second input optical path (31') associated with a third and fourth output optical paths (35',37'),~~

wherein the micromirror being able is configured to interpose itself either between one of an output of the first input optical path and inputs of the first and second output optical paths, or and between an output of the second input optical path and inputs of the third and fourth output optical paths.

3. (AMENDED) ~~Optical~~ An optical switch as in claim 1 ~~or 2, characterized in that wherein the first optical path and the first and second input and output optical paths are chosen independently from one another from among selected from the group comprising optical fibres or and optical guides.~~

4. (AMENDED) ~~Optical~~ An optical switch as in ~~any of claims 1 to 3~~ claim 1, ~~characterized in that wherein the first input optical path and the first and second output optical paths are respectively optical guides in a first first substrate (S1), said first substrate further comprising a recess (39) able configured to allow rotation of the reflector part to rotate about the so-called tilt plane (B).~~

5. (AMENDED) ~~Optical~~ An optical switch as in ~~any of claims 1 to 4~~ claim 1, ~~characterized in that wherein the angle α is non is different from zero.~~

6. (AMENDED) ~~Optical~~ An optical switch as in ~~any of claims 1 to 5~~ claim 1, ~~characterized in that wherein each set of electrodes comprises at least one electrode (J1, J21, J22).~~

7. (AMENDED) ~~Optical~~ An optical switch the micromirror comprises at least one limit stop (23) able configured to limit a movement of the reflector part (13).

8. (AMENDED) ~~Optical~~ An optical switch as in claim 7, ~~characterized in that~~ wherein the limit stop, ~~in a switch with a single input path and two output paths,~~ is formed by a boss disposed at one end of the reflector part, and the width of the boss in a plane substantially perpendicular to the tilt plane ~~being is~~ greater than the width of ~~the~~ a recess along the same plane.

9. (AMENDED) ~~Method~~ A method for fabricating an optical switch, ~~characterized in that it comprises the following steps comprising:~~

a) ~~in a first substrate (S1) fabricating at least one~~ fabricating, in a first substrate, a first input optical guide (31), a first and a second output optical ~~guide (35, 37) guides,~~ a recess (39) and a second set of electrodes (J2), the first input optical guide and the first output optical guide having an identical first optical axis ~~called first optical axis,~~ the second output optical guide having a second optical axis ~~called second optical axis,~~ the first and the second optical axes respectively forming an angle θ relative to an axis of symmetry (S);

b) fabricating, in a second substrate (S2), fabricating a micromirror (41) and a first set of electrodes (J1), the micromirror being ~~able to move~~ movable between an output of the input optical guide and inputs of the first and second output optical guides, the micromirror comprising a reflector part (13) and an actuating part (15) having an axis of rotation, the actuating part being configured (17) and able to drive the reflector part in rotation about a ~~so-called~~ tilt plane (B), the tilt plane being substantially perpendicular to a plane containing the axis of rotation, and ~~said the~~ reflector part comprising at least one reflective face (R) in a plane substantially parallel to the tilt plane, the reflective face being configured able to reflect a light wave derived from coming from the first input optical guide towards the second output optical guide; and

e) adding the second substrate onto the first substrate so that the micromirror is ~~able to tilt~~ tiltable within the recess.

10. (AMENDED) ~~Method~~ A method for fabricating an optical switch as in claim 9, ~~characterized in that~~ wherein the second substrate is a stack of a first carrier layer (50), a second layer (51) and a third layer (52) ~~intended to form the micromirror.~~

11. (AMENDED) ~~Method~~ A method for fabricating an optical switch as in claim 10, ~~characterized in that~~ wherein the first carrier layer is a layer of silicon, the second layer is a layer of silicon oxide and the third layer is a silicon film, the micromirror being fabricated in the silicon film.

12. (AMENDED) ~~Method~~ A method for fabricating an optical switch as in claim 11, ~~characterized in that~~ wherein the silicon film is a monocrystalline silicon film.

13. (AMENDED) ~~Method~~ A method for fabricating an optical switch as in claim 9 ~~10, wherein the fabrication of the micromirror at step B) comprises the following steps:~~ wherein fabricating, in a second substrate, the micromirror and the first set of electrodes, comprises:

etching the first carrier layer ~~then~~ and etching the second layer so as to make an opening ~~(33)~~ in the second substrate exposing part of the third layer;

etching the third layer so as to form ~~the~~ patterns corresponding to the reflector part ~~(13)~~ and the actuating part ~~(15)~~ of the micromirror, and so as to release said the reflector and actuating parts from the remainder of the third layer allowing said to allow the third layer to subsist at the axis of rotation of the actuating part so that the micromirror remains joined to the second substrate; ~~(S2):~~ and

depositing a reflective layer on ~~all or part~~ at least a portion of a side face of the reflector part so as to form the reflective face ~~(R)~~ of the micromirror.

14. (NEW) A method for fabricating an optical switch comprising:

etching a first layer and a second layer of a substrate so as to make an opening in the first layer and the second layer to expose an area of a third layer of the substrate;

etching the third layer to form a micromirror comprising a reflector part and an actuating part such that the reflector part and the actuator part are released from a remainder of the third layer and a portion of the third layer forms a hinge connecting the actuator part to the third layer; and

depositing a reflective layer on a surface of the reflective part to form a reflective surface of the micromirror.

15. (NEW) A method for fabricating an optical switch as in claim 14, wherein the actuating part is configured to rotate the reflector part around a rotation axis of the hinge portion.

16. (NEW) A method for fabricating an optical switch as in claim 14, wherein the reflector part is rotatable about a tilt plane substantially perpendicular to a plane containing the rotation axis of the hinge portion and the reflective surface of the reflector part is in a plane substantially parallel to the tilt plane.

17. (NEW) A method for fabricating an optical switch as in claim 14, wherein the first carrier layer is a layer of silicon, the second layer is a layer of silicon oxide and the third layer is a silicon film.

18. (NEW) A method for fabricating an optical switch as in claim 14, further comprising:

fabricating an input optical guide, a first output optical guide, a second output optical guide, and a recess in a support substrate such that the first input optical guide and the first output optical guide have a common first optical axis, the second output optical guide has a second optical axis and the first and second optical axes form an angle.

19. (NEW) A method for fabricating an optical switch as in claim 18, further comprising depositing the substrate from which the micromirror is formed on the support substrate from which the optical guides are fabricated such that the micromirror is tiltable within the recess.

20. (NEW) A method for fabricating an optical switch as in claim 19, wherein the reflective part of the micromirror is movable between an output of the input optical guide and inputs of the first and second output optical guides.